$385.00-201 $40.00-202 - $110.00-103

(2-92)

REQUEST FORM FOR FILING A PATENT APPLICATION UNDER 37 CFR 1.60

DATE: May 13, 1997

DOCKET NUMBER	ANTICIPATED CLASSIFICATION OF THIS APPLICATION		PRIOR APPLICATION EXAMINER	ART UNIT
1342-196	CLASS:	SUBCLASS:	Mark S. Graham	3304

Address to:

ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

This is a Request for filing a _X_ *continuation* application under 37 CFR 1.60, of pending application Number 08/658,315, filed on June 5, 1996 entitled **THERMAL BLANKET**.

1. Enclosed is a copy of the latest inventor-signed prior application, including a copy of the oath or declaration showing the original signature or an indication it was signed. I hereby verify that the papers are a true copy of the latest signed prior application number 08/658,315, and further that all statements made herein of my own knowledge are true; and further that these statements were made with the knowledge that willful false statements and the like are made punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful statements may jeopardize the validity of the application or any patent issuing thereon.

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS	21 - 20 =	1	x $ 22.00 =	$ 22.00
	INDEPENDENT CLAIMS	4 - 3 =	1	x $ 80.00 =	$ 80.00
	MULTIPLE DEPENDENT CLAIMS (if applicable)			+ $ 260.00 =	$
				BASIC FEE	$770.00
			Total of above Calculations =		$872.00
	Reduction by 50% for filing a Small Entity (Note 37 CFR 1.9, 1.27, 1.28).				
				TOTAL =	**$ 436.00**

2. _x_ A verified statement to establish small entity status under 37 CFR 1.9 and 1.27
   _x_ is enclosed.
   _x_ was filed in prior application number 08/658,315 and such status is still proper and desired (37 CFR 1.28(a)).

3. _x_ The Commissioner is hereby authorized to charge any fees which may be required under 37 CFR 1.16 and 1.17, or credit any overpayment to Deposit Account No. 02-0460. A duplicate copy of this sheet is enclosed.

4. _x_ A check in the amount of $ 436.00 is enclosed.

5. _x_ Cancel in this application original claims 2-19 of the prior application before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)

6. _x_ Amend the specification by inserting before the first line the sentence: "This application is a *continuation* of application number 08/658,315, filed June 5, 1996 (status: pending)."

7. ____ Transfer the drawings from the pending prior application to this application and abandon said prior application as of the filing date accorded this application. A duplicate copy of this sheet is enclosed for filing in the prior application. (May only be used if signed by person authorized by 37 CFR 1.138 and before payment of issue fee.)

8. _x_ New formal drawings are enclosed.

F:\WP60\USERS\ATTY\TAM\AUGUSTIN\1342-196.160

9. ___ Priority of foreign application number _____, filed on _____ in _____ is claimed under 35 U.S.C. 119.
   ___ The certified copy has been filed in prior application number __/_____, filed _____.

10. _x_ A preliminary amendment is enclosed.

11. _x_ The prior application is assigned of record to **AUGUSTINE MEDICAL, INC.**.

12. _x_ Also enclosed: Five (5) Information Disclosures Statements & accompanying PTO Form 1449 from parent ccase.

13. _x_ The power of attorney in the prior application is to: (named & address):

Terrance A. Meador, Reg. No. 30,298
BROWN, MARTIN, HALLER & MEADOR
110 West C Street, Ste. 1300
San Diego, California 92101

a. _x_ The power of attorney appears in the original papers in the prior application.
b. ___ Since the power does not appear in the original papers, a copy of the power in the prior application is enclosed.
c. _x_ Address all future correspondence to: (May only be completed by applicant, or attorney or agent of record.)

Terrance A. Meador, Reg. No. 30,298
BAKER, MAXHAM, JESTER & MEADOR
Symphony Towers
750 "B" Street, **Suite 3100**
San Diego, California 92101

13 May 1997
Date

Terrance A. Meador
Signature

___ Inventor(s)
___ Assignee of complete interest
_x_ Attorney or agent of record
___ Filed under 37 CFR 1.34(a)
Registration number if acting under 37 CFR 1.34(a). _____

TERRANCE A. MEADOR, REG. NO. 30,298
Typed or printed name (& registration number if applicable)

F:\WP60\USERS\ATTY\TAM\AUGUSTIN\1342-196.160

"PATENTS"

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	Group Art Unit: Unknown
S.D. AUGUSTINE ET AL	)	
	)	
Serial No. Unknown	)	
(Continuation of 08/658,315, filed 06/05/96)	)	
	)	
Filed: Herewith	)	Examiner: Unknown
	)	
For: THERMAL BLANKET	)	

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

PRELIMINARY AMENDMENT

In advance of the first examination in this case, Applicants request amendment of the subject application, as follows:

IN THE CLAIMS

Please cancel Claims 2-19 in the application

Please add the following claims:

20. (Added) An inflatable thermal blanket for controlling the temperature of a person, comprising:

a laminate base sheet having two ends and two edges defining a periphery of the thermal blanket;

the base sheet including an under layer of a fibrous material, and an upper surface;

a plurality of apertures opening through the base sheet;

an overlaying sheet attached to the upper surface of the base sheet at a plurality of locations within the periphery of the thermal blanket;

the overlaying sheet sealed to the upper surface of the base sheet near the periphery of the thermal blanket to form an inflatable structure comprising the overlaying sheet and the base sheet; and

an opening for admitting warmed air to the inflatable structure;

whereby,

the opening, the inflatable structure, and the apertures allow air to inflate the thermal blanket and to be exhausted from the thermal blanket.

21. (Added) The thermal blanket of Claim 20, wherein the opening is adjacent a foot end.

22. (Added) The thermal blanket of Claim 20, wherein the inflatable structure includes space between the overlaying sheet and the upper surface of the base sheet.

23. (Added) The thermal blanket of Claim 20, wherein the fibrous material is paper.

24. (Added) The thermal blanket of Claim 20, wherein the plurality of apertures have a density pattern in which the density of the apertures in the base sheet increases in a direction toward the periphery of the thermal blanket.

25. (Added) The thermal blanket of Claim 20, wherein the upper surface of the base sheet is a plastic material.

26. (Added) The thermal blanket of Claim 25, wherein the opening is adjacent a foot end.

27. (Added) The thermal blanket of Claim 25, wherein the inflatable structure includes space between the overlaying sheet and the upper surface of the base sheet.

28. (Added) The thermal blanket of Claim 25, wherein the fibrous material is paper.

29. (Added) The thermal blanket of Claim 25, wherein the base sheet includes an upper layer of plastic material on the under layer, a surface of the upper layer being the upper surface.

30. (Added) The thermal blanket of Claim 29, wherein the inflatable structure includes space between the overlaying sheet and the upper surface of the base sheet.

31. (Added) The thermal blanket of Claim 29, wherein the is a fibrous material is paper.

32. (Added) The thermal blanket of Claim 31, wherein the plurality of locations form the inflatable structure into a plurality of elongate, parallel, mutually conducting tubes.

33. (Added) The thermal blanket of Claims 20 or 32, wherein the thermal blanket comprises a self-erecting structure.

34. (Added) A combination for warming a person with the thermal blanket of Claim 20, the combination comprising:

an air hose having two ends;

means for connecting a first end of the air hose to the opening of the thermal blanket; and

a heater/blower connected to a second end of the air hose.

35. (Added) An inflatable thermal blanket, comprising:

a flexible, multi-layer base sheet with a fibrous underlayer and an upper surface;

a flexible upper sheet attached to the upper surface of the base sheet;

the base sheet and upper sheet forming an inflatable structure;

an inflation inlet for admitting an inflating medium into the inflatable structure; and

a plurality of apertures opening through the base sheet for exhausting the inflating medium from the inflatable structure.

36. (Added) The inflatable thermal blanket of Claim 35, further including a head end of the inflatable structure and a non-inflatable recess and the head end.

37. (Added) The inflatable thermal blanket of Claim 36, further including a plurality of seals between the base sheet and the upper sheet that form the inflatable structure into a plurality of elongate, parallel, mutually communicating chambers.

38. (Added) The inflatable thermal blanket of Claim 37, wherein the inflatable structure is a self-erecting structure.

39. (Added) The inflatable thermal blanket of Claim 38, the base sheet further including an upper layer of a flexible material attached to the fibrous under layer.

REMARKS

This Preliminary Amendment is submitted in advance of the first examination of the subject application. No new matter has been entered.

Respectfully submitted,

TERRANCE A. MEADOR
Registration No. 30,298

BAKER, MAXHAM, JESTER & MEADOR
Symphony Towers
750 "B" Street, Suite 3100
San Diego, California 92101

Telephone: (619) 233-9004 Fax: (619) 544-1246

THERMAL BLANKET

BACKGROUND OF THE INVENTION

This invention relates to thermal blankets used in a medical setting to deliver a bath of a thermally-controlled medium to a patient.

The thermal blanket prior art is best expressed in our prior U.S. Patent No. 4,572,188 entitled "AIRFLOW COVER FOR CONTROLLING BODY TEMPERATURE." In our prior patent, a self-erecting, inflatable airflow cover is inflated by the introduction into the cover of a thermally-controlled inflating medium, such as warmed air. When inflated, the cover self-erects about a patient, thereby creating an ambient environment about the patient, the thermal characteristics of which are determined by the temperature of the inflating medium. Holes on the underside of our prior art airflow cover exhaust the thermally-controlled, inflating medium from inside the cover to the interior of the erected structure. Our airflow cover is intended for the treatment of hypothermia, as might occur post-operatively.

Evaluation of our airflow cover by skilled practitioners has resulted in general approbation: the opinion is that the airflow cover efficiently and effectively accomplishes its purpose of giving a thermally-controlled bath. We have realized, however, that, while our prior art airflow cover achieves its objective, certain improvements to it are necessary in order to realize additional clinical objectives and to enjoy further advantages in its use.

SUMMARY OF THE INVENTION

We have improved the clinical usefulness of our self-erecting airflow cover by observing that controlling the contour of its inflatable portion at its head end to define a generally concave non-inflatable portion will permit a care giver to more easily observe a patient's head, face, neck and chest. Further, we have observed that limited venting of the thermally controlled inflating medium from the edges of the cover results in more efficient, more uniform heating within the cover. We have also observed that it is good clinical practice to keep the area of the care site in the vicinity of the patient's head and face as clean as possible.

These three observations have resulted in an improved thermal blanket in which a self-erecting inflatable covering has a head end, a foot end, two edges, and an undersurface. An inflating inlet adjacent said foot end admits a thermally-controlled inflating medium into the covering. An aperture array on the undersurface of the covering exhausts the thermally-controlled inflating medium from the covering into the structure created when the covering self-erects upon inflation. The improvements to this basic structural complement include an uninflatable section at the head end of the covering, exhaust port openings at the edges of the covering, an absorbent bib attached to the covering at the head end adjacent the uninflatable section, and structural features that make the covering simple and economical to produce.

With these improvements, the thermal blanket, when inflated and erected over a patient, delivers the thermally-

controlled inflating medium into the interior of the structure covering the patient, thereby thermally bathing the patient. The first improvement permits full viewing of the head and face of the patient from almost any aspect around the thermal blanket. The exhaust port openings increase the rate of circulation of the inflating medium within the blanket, thereby increasing the temperature within the structure and making the temperature distribution more uniform. The absorbent bib soaks up and retains liquids which might otherwise spread over the care site in the area of a patient's head. Such liquids can include the patient's own perspiration, blood, vomit, saliva, or liquids which are administered to the patient. The absorbent bib also acts to some extent to seal the head end of the inflated structure.

From another aspect, the invention is a thermal blanket for covering and bathing a person in a thermally-controlled medium. The thermal blanket includes a flexible base sheet having a head end, a foot end, two edges, and a plurality of apertures opening between the first and second surface of the base sheet. An overlying material sheet is attached to the first surface of the base sheet by a plurality of discontinuous seams which form the material sheet into a plurality of substantially parallel, inflatable chambers. A continuous seam is provided between the material sheet and the base sheet at the head end to form a non-inflatable viewing recess at the head end. Exhaust port openings are provided through the material sheet to vent the medium from the chambers away from the base sheet. An absorbent bib is

attached to the head end in the vicinity of the viewing recess.

Therefore the invention accomplishes the important objective of providing a self-erecting, inflatable thermal blanket that permits a relatively unobstructed view of a patient's head and face when in use.

Another objective is the efficient and uniform heating of the interior of the structure created when the blanket is inflated with a heat inflating medium.

A signal advantage of the invention is the provision of such a blanket with a means for maintaining the cleanliness of the care site in the vicinity of the patient's head and face.

The advantageous simplified structure of the thermal blanket make its production straightforward and economical.

These and other important objectives and advantages will become evident when the detailed description of the invention is read with reference to the below-summarized drawings, in which:

Figure 1 is a side elevation view of the thermal blanket in use, with associated thermal apparatus indicated schematically;

Figure 2 is an enlarged top plan view of the thermal blanket opened flat;

Figure 3 is an enlarged sectional view taken along 3-3 of Figure 2;

Figure 4 is a further enlarged sectional view taken along line 4-4 of Figure 3; and

Figure 5 is a partial underside view of the thermal blanket.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

When used herein, the term "thermal blanket" is intended to be interchangeable with, but not necessarily limited by, the term "airflow cover" used in our U.S. Patent No. 4,572,188, which is incorporated herein in its entirety by reference. In this description, the term "thermal blanket" is meant to invoke a self-erecting, inflatable structure for delivering a thermally-controlled inflating medium to the interior of the structure created when the thermal blanket is inflated. The purpose of the thermal blanket is to efficiently administer a uniformly thermally-controlled bath of the inflating medium to a patient within the erected structure.

Our invention is illustrated as we intend for it to be used in Figure 1. In Figure 1, a self-erecting, inflatable thermal blanket 10 has a head end 12, a foot end 14 and two lateral edges, one indicated by 15. An inflation inlet cuff 16 is connected to a heater/blower assembly 18 which provides a stream of heated air through a connecting hose 20. When the heater/blower 18 is operated, the stream of heated air flows through the inflating hose 20 into the thermal blanket 10 through the inflation cuff 16. When the blanket is inflated, it erects itself into a Quonset hut-like structure with a quilted upper surface 21. As described below, a pattern of apertures on the undersurface of the blanket (not shown in Figure 1) delivers the inflating heated air into the interior space enclosed by the erected thermal blanket.

The contour of the inflatable portion of the thermal blanket 10 is varied at the head end 12 of the blanket to

provide a non-inflated blanket recess 22 in the quilted upper surface 21, which remains smooth and flat when the blanket is inflated and erected. Circulation of the heated air is accelerated through the thermal blanket by exhaust port openings in the upper surface, adjacent the lateral edges of the blanket. Two exhaust port openings are indicated by reference numeral 23. Further, a bib 24 made of an absorbent material is attached to the head end 12 of the thermal blanket in the vicinity of the non-inflated recess 22. In fact, as shown in Figure 1, the bib 24 includes a semi-circular tab 25 that extends into the recess 22.

As illustrated in Figure 1, the thermal blanket of the invention is inflated, erects itself into a bathing structure, and bathes a patient 26 with the thermally-controlled air used to inflate the structure. While the patient is being thermally bathed, the uninflated recess 22 permits observation of the patient's head, face, neck, and chest from almost any location with respect to the thermal blanket 10. Thus, if the patient is placed on a gurney or a bed, the head of which is against a wall, a care giver such as a nurse, intern, resident, or doctor, can keep the patient's face under observation from the foot end 14 of the thermal blanket 10. Respiration can be detected by the rise and fall of the bib and uninflated area, which rest directly on the patient's chest. Moreover, the bib 24 will provide an absorbent sink for stray, unconfined liquids in the area of the patient's head or at the head end 12 of the thermal blanket 10.

Figure 2 is a plan view of the thermal blanket 10 opened flat to show details of its structure. Figure 2 illustrates the upper surface of the thermal blanket, that is the side that is visible in Figure 1. As seen, the upper surface consists of a parallel array of elongated tubes of which 30 and 32 are the lateralmost tubes, 34 is the center tube, and the tubes 38 are arrayed between one of the lateralmost tubes and the center tube. Each tube is separated from an adjacent tube by a discontinuous seam, one of which is indicated by 40. The seam 40 separates the tube 32 and its nearest adjacent neighbor 38. The discontinuous seam 40 is interrupted by passageways 42 communicating between the tubes. An interrupted seam separates every tube from one adjacent neighboring tube. The seams permit the thermal blanket, when inflated, to assume a tubular structure on the upper surface, while the ports 42 permit full circulation of the inflating medium throughout the array of tubes. The foot-end seam 45 is continuous. The tubes are inflated through the center tube 34 which transitions to a port 36, through which the inflation cuff 16 is inserted. The edge seams 43 are discontinuous only at the exhaust port opening locations 23. A seal can be made between the inflation port 36 and the inflation cuff 16 by any conventional means, for example, an O-ring, or even tape. When the inflating medium is introduced into the center tube 34, it flows laterally from the center tube into all of the other tubes through the ports 42. Near the head end 12, a continuous seam 40 defines the forward end of all of the tubes, with the seam assuming a bell-curve shape. On the head end side of the seam 40, the thermal blanket 10 is

uninflatable. The bell-shaped seam 40 thus defines the uninflatable area 22 at the head end of the thermal blanket 10, which is essentially coplanar with, or substantially parallel to, the underside of the blanket. As shown in Figure 1, by virtue of its structural integration with the rest of the thermal blanket 10, the non-inflated recess extends over the upper chest of the patient 26 when the blanket is inflated. However, since the recess 22 is uninflated, it provides a wide-angled viewing gap in the inflated contour of the upper surface 21. The gap is filled by continuation of the underside of the blanket. It is also noted that the pattern of inflatable tubes can be replaced by other suitable patterns of communicating, inflatable chambers. The tubes are preferred since they impart strength and shape to the erected bathing structure; other inflatable structures are contemplated, however.

The absorbent bib has an indent 43 cut into its outside edge, which permits the blanket to be drawn up to the chin of a patient and which provides absorbency laterally up the neck of the patient. The absorbent bib can consist of any absorbent material such as a single- or multi-ply tissue paper which is used to make paper towels.

Construction details of the thermal blanket 10 are illustrated in Figures 3 and 4. The thermal blanket 10 is assembled from a base sheet consisting of an underside layer 50 formed from flexible material capable of bonding to a layer 52 of heat-sealable plastic. For the layers 50 and 52, we have used a stratum of absorbent tissue paper prelaminated with a layer of heat-sealable plastic. Material of such construction is commercially available in

production rolls and is used to make painters' drop cloths. The upper side of the thermal blanket consists of a sheet of plastic bonded to the plastic layer 52 by an interruptible heat-sealing process to form the interrupted seams, one of which is indicated by 54, and the inflatable tubes, one indicated by 55. As can be seen in Figure 3, the interruption of the seam 54 forms a passageway 56 between adjacent tubes 55 and 57.

The absorbent bib and tab are shown in Figure 3 as a single material layer 60/58. Alternatively, they may be formed from separate material sheets cut to the outlines illustrated in Figure 2. The absorbent material forming the bib and tab can be bonded to the upper plastic layer by heat process or by gluing.

The inventors also contemplate deletion of the bib and tab. In this instance, the thermal blanket would still have the viewing recess, which would be defined by the continuous seam at the head end, and which would be filled with the forward portion of the base sheet.

Circulation of heated air through the blanket is enhanced by the exhaust port openings 23, which open through the upper plastic sheet sheet, which is heat sealed to the base of the blanket. The openings 23 vent the heated inflating air out of the outermost tubes 30 and 32, away from the underside of the blanket. Because air can circulate to, and through, the blanket edges, the inflating air in the outermost tubes is hotter than if the openings were absent. This results in hotter air being delivered through the underside apertures toward the edge of the blanket. We have measured the temperature distribution

within the thermal blanket for inflating air which is heated to a medium temperature range and for inflating air which is heated to a high temperature range. The results are provided in Table I for a blanket consisting of 13 tubes. Measurements of the temperature of air exhausted through underside apertures were made on the underside of each tube on one side of the blanket. The tubes are numbered 1-6, with 1 being the tube adjacent to the center tube, and tube 6 being the outermost tube adjacent on lateral edge of the blanket. Test apertures were made in the bottom of tube 6 only for the purposes of this test. As is evident, the distribution of temperature within the erected thermal blanket is more uniform when the exhaust port openings are provided. Further, provision of the exhaust ports also increases the average temperature within the erected structure of the blanket. Clearly, the provision of exhaust port openings at the lateral edges of the blanket delivers results which one would not expect when considering the operation of our thermal blanket with no exhaust port openings.

In our preferred embodiment, the exhaust port openings are slits in the edge seams of our blanket. These slits vary in length from 1-3/4 to 2 inches. Each edge seam is discontinuous approximately at each corner of the blanket so that inflating air is vented away from the underside of the erected blanket. This keeps the relatively "colder" air at the blanket edges from mixing with the relatively "hotter" air exhausted into the structure through the underside apertures. The result is a "flatter" temperature profile of air within the blanket than without the vents, which raises

the average temperature within the erected structure and makes the temperature distribution in the structure more uniform. Resultantly, the clinical effect of the blanket is enhanced. Heating is better controlled, and more uniform, with greater comfort to the patient.

TABLE I

TUBE NO.	MEDIUM TEMPERATURE RANGE		HIGH TEMPERATURE RANGE	
	WITHOUT EXHAUST PORTS	WITH 2" EXHAUST PORTS	WITHOUT EXHAUST PORTS	WITH 2" EXHAUST PORTS
center (inlet) tube	113.3° F.	114.1° F.	121.3° F.	121.3° F.
Tube #1	109.9°	112.3°	117.3°	117.7°
Tube #2	105.3°	109.8°	113.4°	115.0°
Tube #3	103.2°	107.1°	111.0°	113.3°
Tube #4	99.9°	104.3°	101.4°	108.6°
Tube #5	97.2°	100.0°	95.7°	104.4°
Tube #6 (outermost)	85.2°	95.8°	89.6°	99.4°
Average temp. under cover	103.8°	106.7°	108.4°	112.5°

The thermal blanket of the invention is enabled to bathe a patient in the thermally-controlled inflating medium introduced into the upper side tubes by means of a plurality of apertures 62 shown in Figures 4 and 5. The apertures extend through the underside of the blanket, which includes the layers 50 and 52. The apertures 62 are made in the footprints of the tubes of the blanket upper side according to a pattern which has been determined to deliver a very uniform thermal bath. In this regard, no apertures are provided through the underside into the lateralmost tubes 30 and 32, or into the center tube 34. In addition, the apertures 62 are provided through the underside to the apertured tubes in a density which varies inversely with the proximity of the tube to the center tube 34. Thus, the hole density increases from the tube 38a through the tube 38d. Even with the exhaust port openings, the temperature of the inflating medium exhibits a drop from the center to the lateralmost tubes. The varying density of the apertures 62 tends to reduce this gradient further by forcing hotter air to the edges of the blanket. Thus, the thermal bath delivered to the patient is of a generally uniform temperature. The aperture density variation also equalizes the flow of inflating medium out of the apertures. As will be evident, the inflating pressure will be greatest at the center tube 34 and will tend to diminish toward the lateral edges of the thermal blanket. Therefore, fewer apertures are required for the tubes near the center tube 34 to deliver the same amount of air as the relatively greater number of apertures in the tubes at a greater distance from the center tube 34.

The apertures comprise openings which can be of any appropriate shape. For example, we have produced blankets with elongated apertures, approximately 1/4 inch in length.

Many modifications and variations of our invention will be evident to those skilled in the art. It is understood that such variations may deviate from specific teachings of this description without departing from the essence of the invention, which is expressed in the following claims.

We claim:

CLAIMS

1. A thermal blanket for covering and bathing a person in a thermally-controlled inflating medium, comprising:

a flexible base sheet having a head end, a foot end, two edges, and a plurality of apertures;

an overlaying flexible material sheet attached to a first surface of said base sheet by a plurality of discontinuous seams which form said overlaying material sheet into a plurality of communicating, inflatable chambers, said apertures opening through said base sheet into said chambers; and

a continuous seam between said overlaying material sheet and said base sheet at said head end which forms a non-inflatable viewing area in said blanket at said head end, said non-inflatable viewing area being substantially coplanar with, or parallel to, said base sheet.

2. The thermal blanket of claim 1 wherein said base sheet includes an undersheet of flexible fibrous material and a sheet of plastic material coextensive with and attached to said undersheet.

3. The thermal blanket of claim 1 wherein said base sheet includes a multi-layered structure in which the bottommost layer is a paper sheet bonded to an upper sheet of plastic material.

4. The thermal blanket of claim 2 wherein said discontinuous seams are substantially elongate, formed seals between said overlaying material sheet and sheet of plastic material.

5. The thermal blanket of claim 2 wherein one of said discontinuous seams includes a sequence of collinear, formed seals extending from said foot end to said head end.

6. The thermal blanket of claim 5 wherein said plurality of discontinuous seams form said overlaying material sheet into a plurality of mutually parallel, communicating tubular chambers.

7. The thermal blanket of claim 1 including an exhaust port opening through said material sheet adjacent one of said edges for venting an inflating medium from said chambers and away from said base sheet.

8. The thermal blanket of claim 1 including a patterned array of apertures opening through said underside into said chambers, said patterned array comprising a density pattern in which the density of said apertures increases toward one of said edges.

9. The thermal blanket of claim 6 including a patterned array of apertures, said apertures opening through said base sheet into said chambers, said patterned array comprising a density pattern in which the density of said apertures increases toward on of said edges.

10. The thermal blanket of claim 9 wherein one of said tubular chambers is centrally positioned in said parallel tubular chambers and said density increases from said centrally positioned chamber toward one of said edges.

11. The thermal blanket of claim 10 wherein no apertures open through said base sheet into said centrally positioned tubular chamber.

12. The thermal blanket of claim 11 wherein no apertures open through said base sheet into a tubular chamber adjacent one of said edges.

13. A thermal blanket, comprising:

a self-erecting inflatable covering with a head end, a foot end, two edges, and an undersurface;

an inflating inlet adjacent said foot end for admitting a thermally-controlled inflating medium;

an array of apertures in said undersurface for exhausting a thermally controlled inflating medium from said covering;

an exhaust port opening in said inflatable covering for venting an inflating medium from adjacent an edge of said inflatable covering and away from said undersurface; and

a flat uninflatable section at said head end for upper body viewing.

14. The thermal blanket of claim 13, wherein said pattern of said array of apertures increases the density of said apertures from a central location on said undersurface in a direction toward a first one of said edges.

15. The thermal blanket of claim 14 wherein the pattern of said array of apertures increases the density of said apertures from said central location in a direction toward the second of said edges.

16. A thermal blanket for covering and bathing a person in a thermally-controlled medium, comprising:

a flexible base sheet having a head end, a foot end, two edges, and a plurality of apertures;

an overlaying plastic sheet attached to a first surface of said base sheet by a plurality of discontinuous seams which form said plastic sheet into a plurality of communicating inflatable chambers, said apertures opening through said base sheet into said chambers;

a continuous seam between said plastic sheet and said base sheet at said head end which forms a non-inflatable viewing recess; and

an exhaust vent through said overlaying plastic sheet and adjacent a first, opening from a first inflatable chamber adjacent said first edge, for venting an inflating medium away from said base sheet, and away from a second inflatable chamber.

17. The thermal blanket of clair 16 including an absorbent bib attached to the head end of said base sheet.

18. A thermal blanket for covering and bathing a person in a thermally-controlled medium, comprising:

a flexible base sheet having a head end, a foot end, two edges, and a plurality of apertures;

an overlaying plastic sheet attached to a first surface of said base sheet by a plurality of discontinuous seams which form said plastic sheet into a plurality of communicating inflatable chambers, said apertures opening through said base sheet into said chambers;

a continuous seam between said plastic sheet and said base sheet at said head end which forms a non-inflatable viewing recess; and

an absorbent bib attached to the head end of said base sheet.

19. A thermal blanket, comprising:

a self-erecting inflatable covering with a head end, a foot end, two edges, and an undersurface;

an inflating inlet for admitting a thermally-controlled inflating medium;

an array of apertures in said undersurface for exhausting a thermally-controlled inflating medium from said covering;

an uninflatable section at said head end for upper body viewing; and

an absorbent bib attached to the head end of said inflatable covering.

THERMAL BLANKET

ABSTRACT

A thermal blanket includes an inflatable covering with a head end, a foot end, two edges and an undersurface. The covering is inflated through an inlet at the foot end by a thermally-controlled inflating medium. An aperture array on the undersurface of the covering exhausts the thermally-controlled inflating medium from the covering. Exhaust port openings are provided at the edges of the covering to vent the inflating medium, which enhances circulation of the thermally-controlled medium through the cover. An uninflatable section is provided at the head end, together with an absorbent bib attached to the covering, adjacent the uninflatable section. When inflated, the thermal blanket self-erects and provides a bath of thermally-controlled inflating medium to the interior of the erected structure. The enhanced circulation of the medium through the covers maintains a relatively high average temperature under the blanket and a relatively uniform distribution of temperature in the inflating medium which is exhausted through the apertures into the structure's interior. When the structure covers a patient, the uninflatable section provides a relatively unobstructed view of the patient's face, while the absorbent bib maintains a relatively sanitary environment in the area beneath the patient's head.

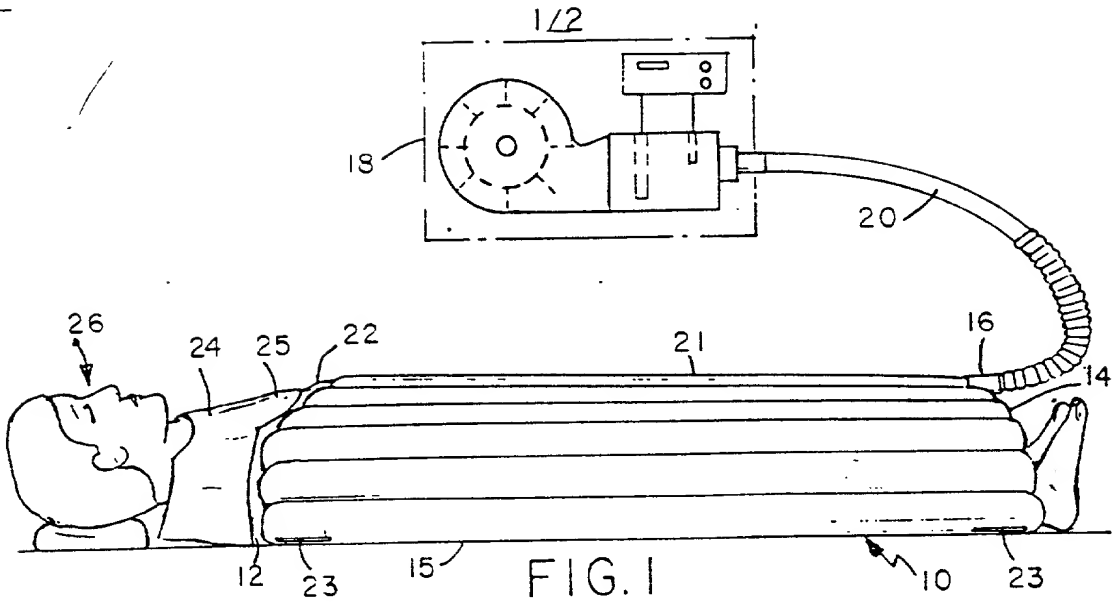
18
20
26
24
25
22
21
16
14
12
23
15
10
23

FIG. 1

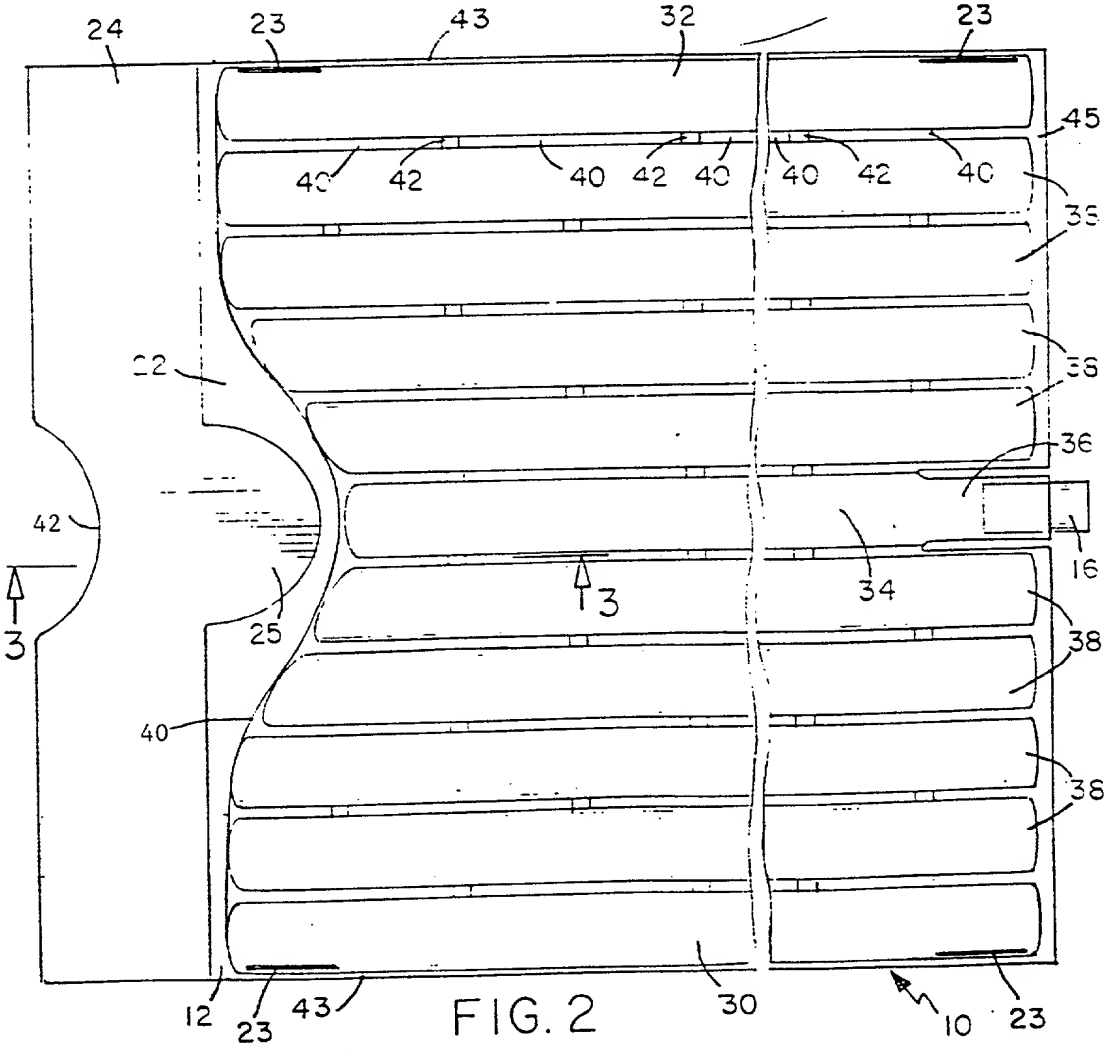
24
23
43
32
23
45
40
42
40
42
40
40
42
40
38
38
36
22
42
3
3
25
34
16
38
40
38
12
23
43
30
10
23

FIG. 2

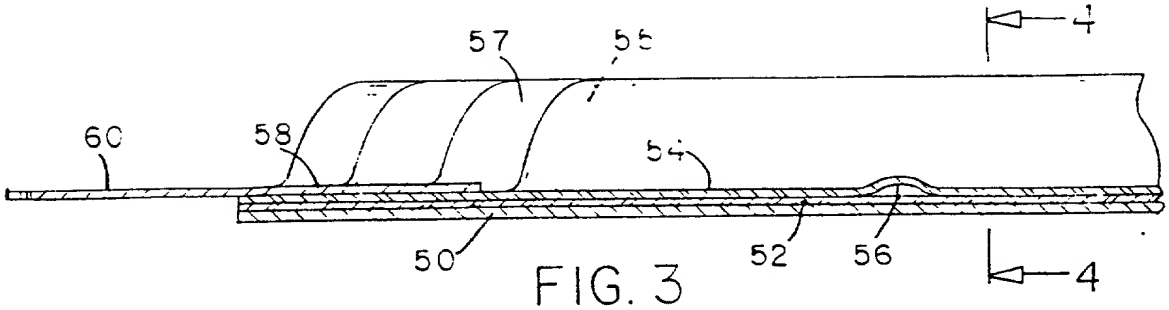

FIG. 3

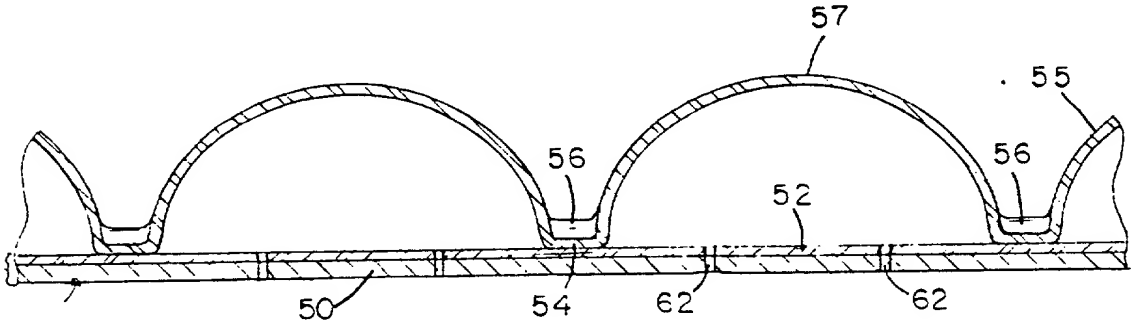

FIG. 4

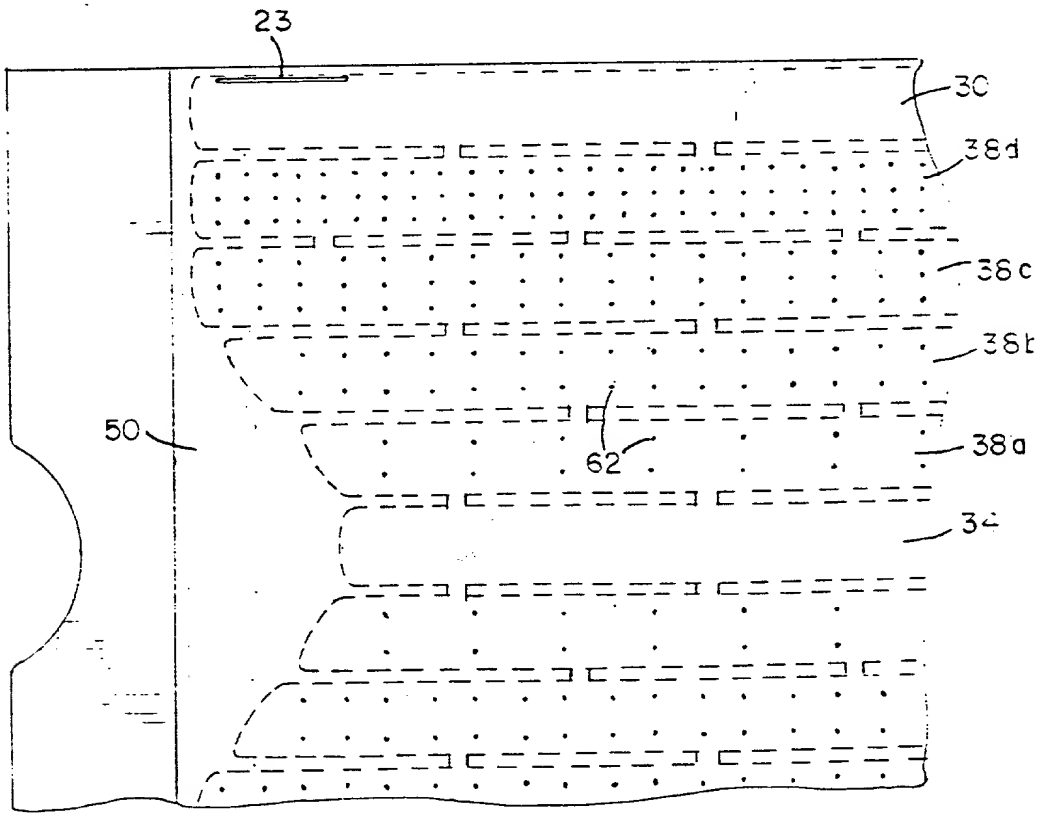

FIG. 5

As A BELOW NAMED INVENTOR, I HEREBY DECLARE THAT: This Declaration is of the following type:

☐ Original ☐ Supplemental ☒ Continuation-In-Part ☐ Divisional

☐ Continuation ☐ National Stage of PCT

My residence, post office address and citizenship are as stated below next to my name; I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: THERMAL BLANKET

the specification of which:

☒ is attached hereto.

☐ was filed on _____, as Serial No. _____.

☐ was amended on _____ (if applicable).

☐ was described and claimed in PCT International Application No. _____ filed on _____ and as amended under PCT Article 19 on _____ (if any).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Sec. 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, Sec. 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

(Country)	(Appln. No.)	(Day/Month/Year Filed)	Priority Claimed (Yes)	(No)
(Country)	(Appln. No.)	(Day/Month/Year Filed)	(Yes)	(No)

I hereby claim the benefit under Title 35 USC 120 of the United States application(s) listed below, and insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35 USC 112, I acknowledge the duty to disclose material information as defined in Title 37 CFR 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

07/104,682 (Serial No.)	October 5, 1987 (Filing Date)	Pending (Status)
(Serial No.)	(Filing Date)	(Status)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the U. S. Patent and Trademark Office connected therewith: CARL R. BROWN, Reg. #18,587; NEIL F. MARTIN, Reg. #23,088; JOHN L. HALLER, Reg. #27,795; TERRANCE A. MEADOR, Reg. #30,298; JAMES W. MC CLAIN, Reg. #24,536

Address all telephone calls to TERRANCE A. MEADOR at (619) 238-0999 and address all correspondence to BROWN,MARTIN,HALLER & MEADOR, 110 West C St., Ste.1300, San Diego, CA 92101.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the applications or any patent issued therefrom.

FULL NAME OF SOLE/FIRST INVENTOR	INVENTOR'S SIGNATURE	DATE
SCOTT D. AUGUSTINE	Scott D Augustine	7/29/88
POST OFFICE ADDRESS 1601 Stonecrest Court, Blue Springs, MO 64015		CITIZENSHIP USA
FULL NAME OF JOINT/SECOND INVENTOR	INVENTOR'S SIGNATURE	DATE
DOUGLAS J. AUGUSTINE	Douglas J Augustine	7/29/88
POST OFFICE ADDRESS 503 South 23rd Street, Blue Springs, MO 64015		CITIZENSHIP USA

Serial or Patent No. : [illegible] Attorney's Docket No.: 0545-PA-09
Filed or Issued: Filed herewith
For: THERMAL BLANKET

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) and 1.27(b) - INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Section 41 (a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled THERMAL BLANKET

described in

[x] the specification filed herewith
[ ] application serial no. _____, filed _____
[ ] patent no. _____, filed _____

I have not assigned, granted, conveyed or licensed and an under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

[x] no such person, concern or organization
[ ] persons, concerns, or organizations listed below*

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27).

FULL NAME _____
ADDRESS _____
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

FULL NAME _____
ADDRESS _____
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

FULL NAME _____
ADDRESS _____
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made in the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

SCOTT D. AUGUSTINE	DOUGLAS J. AUGUSTINE	
NAME OF INVENTOR	NAME OF INVENTOR	NAME OF INVENTOR
Scott D Augustine	Douglas J Augustine	
Signature of Inventor	Signature of Inventor	Signature of Inventor
Date 7/29/00	Date 7/29/00	Date